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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/692,666	SHEN ET AL.
	Examiner	Art Unit
	Mia M. Thomas	2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8,10-13,15-18,20* is/are rejected.

7)☒ Claim(s) *9,14 and 19* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 October 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date *see attached*.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Suggestions

1. Examiner suggests that the invention point to exactly what is claimed as the invention, for example, at claim 9, the method of claim 8, wherein said performing a golden section search comprises: (1) initializing **the another** color matching parameter and a minimum color matching error...

It is suggested that the applicant remove the word "the" when referring to "another color matching parameter". It will deter any misinterpretation of antecedent problems related to color matching parameters.

Drawings

2. Color photographs and color drawings are not accepted unless a petition filed under 37 CFR 1.84(a)(2) is granted. Any such petition must be accompanied by the appropriate fee set forth in 37 CFR 1.17(h), three sets of color drawings or color photographs, as appropriate, and, unless already present, an amendment to include the following language as the first paragraph of the brief description of the drawings section of the specification:

> The patent or application file contains at least one drawing executed in color. Copies of this patent or patent application publication with color drawing(s) will be provided by the Office upon request and payment of the necessary fee.

Color photographs will be accepted if the conditions for accepting color drawings and black and white photographs have been satisfied. See 37 CFR 1.84(b)(2).

Examiner notes that a petition for color photographs /drawings has not yet been filed as of the mailing of this office action. Appropriate correction is required.

3. Drawings 3, 8-10 are objected to under 37 CFR 1.83(a) because they fail to show appropriate contrast and sufficient details to describe the claimed invention as laid out in the specification. For example, in Figure 3, there are not visible outliers shown in this Figure. It is important to disclose and exhibit the claimed invention as intended with respect to the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or

"New Sheet" pursuant to 37 CFR 1.121(d). If the examiner does not accept the changes, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-5, 16 and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Masaki (US 7,215,812 B1).

Regarding Claim 1: Masaki discloses a method for color matching a first image and a second image, wherein a first region of the first image and a second region of the second image overlap ("An image processing method for carrying

out predetermined correction processing with respect to one or more items regarding the quality of color images..."at abstract), the method comprising: generating a first histogram of the first region; generating a second histogram of the second region (Refer to Figure 5);

determining corresponding pixel values from the first and the second histograms (Refer to Figure 4, numeral #51);

determining at least one parameter of an optoelectronic conversion function (OECF) that best matches the corresponding pixel values (Refer to Figure 4, numeral #41);

and color matching the second image to the first image by applying the OECF with the at least one parameter to the second image (Refer to Figure 4, numerals #53-#59)

Regarding Claim 2: Masaki discloses the method of claim 1, further comprising, prior to said generating a first histogram and generating a second histogram: removing a percentage of the overlapping pixels with the greatest difference in brightness (Refer to Figure 4, numeral #45).

Regarding Claim 3: Masaki discloses the method of claim 1, wherein: said generating a first histogram comprises recording in a first plurality of pixel value bins a first plurality of numbers of pixels that have respective pixel values in the first region (Refer to Figures #41 and #43); and said generating a

second histogram comprises recording in a second plurality of pixel value bins a second plurality of numbers of pixels that have the respective pixel values in the second region (Refer to Figures #49 and #51).

Regarding Claim 4: Masaki discloses the method of claim 3, wherein said determining corresponding pixel values in the first and the second histograms comprises generating a lookup table (LUT) storing a third plurality of numbers of pixels and their corresponding pixel values (Refer to Figure 1, numeral 202).

Regarding Claim 5: Masaki discloses the method of claim 4, wherein said generating a lookup table comprises:

(1) initializing all entries in the LUT to 0;

(2) initializing a first loop by setting $i = 0$; $j = 0$; $rem1 = h1[0]$; and $rem2 = h2[0]$;

(3) updating the LUT by setting $min\_rem = \min(rem1, rem2)$; $rem1 = rem1 - min\_rem$; and $rem2 = rem2 - min\_rem$; and incrementing LUT[i][j] by min_rem;

(4) if $rem1 = 0$, then incrementing i and setting $rem1 = h1[i]$;

(5) if $rem2 = 0$, then incrementing j and setting $rem2 = h2[j]$;

(6) if $i < 256$ and $j < 256$, then repeating steps (3) to (5);

wherein h1[ ] is the number of pixels having a certain pixel value in the first histogram, h2[ ] is the number of pixels having a certain pixel value in the

second histogram, and LUT[ ][ ] is the number of pairs of corresponding pixel values having a certain pixel value in the first histogram and a certain pixel value in the second histogram (Refer to Figure 1, numeral 203).

Regarding Claim 16: Masaki discloses a method for color matching a first image and a second image, wherein a first region of the first image and a second region of the second image overlap ("An image processing method for carrying out predetermined correction processing with respect to one or more items regarding the quality of color images..."at abstract), the method comprising: removing a percentage of overlapping pixels with the greatest difference in brightness (Refer to Figure 4, numeral #45); generating a first histogram of the first region and a second histogram of the second region after said removing (Refer to Figure 5); histogram matching the first and the second histogram to determine corresponding pixel values from the first and the second histograms (Refer to Figure 4, numeral #43-#47); minimizing a color matching error between the corresponding pixel values, wherein the color matching error is generated from an optoelectronic conversion function (OECF) (Refer to Figure 4, numeral #41); and color matching the second image to the first image by applying the OECF to the second image (Refer to Figure 4, numerals #53-#59).

Referring to Claim 17: Masaki discloses the method of claim 16, wherein said histogram matching the first and the second histograms comprises generating a lookup table (LUT) as follows: (1) initializing all entries in the LUT to 0;

(2) initializing a first loop by setting $i = 0$; $j = 0$; *rem1* = h1[0]; and *rem2* = h2[0];

(3) updating the LUT by setting *min_rem* = min(*rem1*, *rem2*); *rem1* = *rem1* – *min_rem*; and *rem2* = *rem2* – *min_rem*; and incrementing LUT[*i*][*j*] by *min_rem*;

(4) if *rem1* = 0, then incrementing *i* and setting *rem1* = h1[*i*];

(5) if *rem2* = 0, then incrementing *j* and setting *rem2* = h2[*j*];

(6) if $i < 256$ and $j < 256$, then repeating steps (3) to (5);

wherein h1[ ] is the number of pixels having a certain pixel value in the first histogram, h2[ ] is the number of pixels having a certain pixel value in the second histogram, and LUT[ ][ ] is the number of pairs of corresponding pixel values having a certain pixel value in the first histogram and a certain pixel value in the second histogram (Refer to Figure 1, numeral 203).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary

> skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Masaki (US 7,215,812 B1) in combination with Hasler "Modeling the Opto-Electronic Conversion Function (OECF) For Application in the Stitching of Panoramic Images, hereinafter referred to as Hasler- (MOASPI).

Regarding Claim 6:

Masaki discloses determining at least one parameter of an optoelectronic conversion function (OECF) that best matches the corresponding pixel values and color matching the second image to the first image by applying the OECF with the at least one parameter to the second image.

Masaki does not specifically disclose wherein said determining at least one parameter of an OECF comprises minimizing a color matching error, the color matching error being defined as:

$$e = \sum_{i=0}^{255}\sum_{j=0}^{255} LUT[i][j]((i+1)/256.0 - S^{-1}(\tau S((j+1)/256.0))),$$

wherein e is the color matching error, r is a color matching parameter, and S( ) is the OECF

Hasler – (MOASPI) teaches the method of claim 5, wherein said determining at least one parameter of an OECF comprises minimizing a color matching error, the color matching error being defined as:

$$e = \sum_{i=0}^{255}\sum_{j=0}^{255} LUT[i][j]((i+1)/256.0 - S^{-1}(\tau S((j+1)/256.0))),$$

wherein e is the color matching error, r is a color matching parameter, and S( ) is the OECF (Refer to Equation 2b, right column, section 4, “The Error Metric”).

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to define the color matching error as taught by Hasler at Equation 2b to be the determination and defining elements of the OECF to determine a parameter for application as disclosed by Masaki because this function "creates parameters that account for the difference in exposure of the two pictures" as disclosed in the claimed invention.

Regarding Claim 7:

Masaki discloses determining at least one parameter of an optoelectronic conversion function (OECF) that best matches the corresponding pixel values and color matching the second image to the first image by applying the OECF with the at least one parameter to the second image.

Masaki does not specifically disclose wherein the OECF is defined as:

$$S(x) = x + \frac{2}{\pi}\arctan\left(\frac{a\sin(\pi x)}{1 - a\cos(\pi x)}\right),$$

, wherein x is a pixel value normalized to (0,1), and a epsilon.(-1,1) is another color matching parameter (Refer to Equation 1, right column, section 3, "The OECF Model").

Hasler– (MOASPI) teaches the method of claim 6, wherein the OECF is defined as:

$$S(x) = x + \frac{2}{\pi}\arctan\left(\frac{a\sin(\pi x)}{1 - a\cos(\pi x)}\right),$$

, wherein x is a pixel value normalized to (0,1), and a epsilon.(-1,1) is another color matching parameter (Refer to Equation 1, right column, section 3, "The OECF Model").

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to define the OECF as taught by Hasler to be incorporated as the function disclosed by Masaki because this function

"creates parameters that account for the difference in exposure of the two pictures" as disclosed in the claimed invention.

Regarding Claim 10:

Masaki discloses determining at least one parameter of an optoelectronic conversion function (OECF) that best matches the corresponding pixel values and color matching the second image to the first image by applying the OECF with the at least one parameter to the second image.

Masaki does not specifically disclose wherein said applying the optoelectronic conversion function comprises: $x_c = S^{-1}(W(\tau, x_o)S(x_o)),$ wherein x.sub.o is an original pixel value in the second image, x.sub.c is a corrected pixel value in the second image, S.sup.-1( ) is the inverse of the OECF, and W is a weight function defined as: $W(\tau, x_I) = \tau + (1 - \tau)x_I.$

Hasler- (MOASPI) teaches the method of claim 6, wherein said applying the optoelectronic conversion function comprises: $x_c = S^{-1}(W(\tau, x_o)S(x_o)),$ wherein x.sub.o is an original pixel value in the second image, x.sub.c is a corrected pixel value in the second image, S.sup.-1( ) is the inverse of the OECF, and W

is a weight function defined as: $W(\tau, x_i) = \tau + (1-\tau)x_i$. (Refer to Equation 4, left column, section 5, "The Complete Model").

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to apply the inverse of the OECF as taught by Hasler to the application of the OECF as disclosed by Masaki because "it will avoid the degenerate solution and is convenient to approximate." (Hasler, page 2, paragraph 3).

Regarding Claim 11:

Masaki discloses determining at least one parameter of an optoelectronic conversion function (OECF) that best matches the corresponding pixel values.

Masaki does not specifically disclose the OECF is defined as:

$$S(x) = x + \frac{2}{\pi}\arctan\left(\frac{a\sin(\pi x)}{1 - a\cos(\pi x)}\right),$$

wherein S( ) is the OECF, x is a pixel value normalized to (0,1), and a.epsilon.(-1,1) is a first color matching parameter

Hasler– (MOASPI) teaches the method of claim 1, wherein the OECF is defined as:

$$S(x) = x + \frac{2}{\pi}\arctan\left(\frac{a\sin(\pi x)}{1 - a\cos(\pi x)}\right),$$

wherein S( ) is the OECF, x is a pixel value normalized to (0,1), and a.epsilon.(-1,1) is a first color matching parameter (Refer to Equation 1, right column, section 3, "The OECF Model").

At the time the invention was made, it would have been obvious to define the OECF function as taught by Hasler to be further defined and incorporated as the OECF as disclosed by Masaki because the OECF with these definitive elements can "deliver an optimal result in a least square error sense." (Hasler, abstract)

Regarding Claim 12:

Masaki discloses determining at least one parameter of an optoelectronic conversion function (OECF) that best matches the corresponding pixel values.

Masaki does not specifically disclose wherein said determining at least one parameter of

an OECF comprises minimizing a color matching error defined as:

$$e = \sum_{x_1 \in \mathfrak{R}_1, x_2 \in \mathfrak{R}_2} \left\| x_1 - S^{-1}(\tau S(x_2)) \right\|^2,$$

wherein e is the color matching error, x.sub.1 and x.sub.2 are corresponding pixel values in the first and the second regions, R.sub.1 and R.sub.2 are the first and the second regions, S( ) is the OECF, S( ).sup.-1 is the inverse OECF, and .tau. is a second color matching parameter.

Hasler– (MOASPI) teaches the method of claim 11, wherein said determining at least one parameter of
an OECF comprises minimizing a color matching error defined as:

$$e = \sum_{x_1 \in \mathcal{R}_1, x_2 \in \mathcal{R}_2} \left\| x_1 - S^{-1}(\tau S(x_2)) \right\|^2,$$

wherein e is the color matching error, x.sub.1 and x.sub.2 are corresponding pixel values in the first and the second regions, R.sub.1 and R.sub.2 are the first and the second regions, S( ) is the OECF, S( ).sup.-1 is the inverse OECF, and .tau. is a second color matching parameter (Refer to Equation 2d, left column, paragraph 2, section 4 "The Error Metric").

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to add a color matching error based on at least one parameter as taught by Hasler to the OECF function as disclosed by Masaki because this color matching error as "defined applies to the region of the histogram that contains most of the data still delivering a small error." (Hasler, page 2, right column, 2nd paragraph).

Regarding Claim 13:

Masaki discloses determining at least one parameter of an optoelectronic conversion function (OECF) that best matches the corresponding pixel values.

Masaki does not specifically disclose minimizing a color matching error comprises performing a golden section search of the color matching error.

Hasler– (MOASPI) teaches the method of claim 12, wherein said minimizing a color matching error comprises performing a golden section search of the color matching error (For example, refer to equations (10.1.6) and (10.1.7) in reference to the golden mean or golden section search examples).

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to utilize a golden section search of the color matching error as taught by Hasler to the OECF function and the corresponding objective of minimizing the color matching error as disclosed by Masaki because "the golden section search guarantees that each new function evaluation will bracket minimum to an interval a precise number times the size of the preceding interval." (Press, page 399-400, last paragraph, final sentence).

Regarding Claim 15:

Masaki discloses determining at least one parameter of an optoelectronic conversion function (OECF) that best matches the corresponding pixel values.

Masaki does not specifically disclose applying the OECF comprises:

$x_c = S^{-1}(W(\tau, x_o)S(x_o))$, wherein x.sub.o is an original pixel value in the second image, x.sub.c is a corrected pixel value in the second image, and W is a weight function defined as: $W(\tau, x_l) = \tau + (1 - \tau)x_l$.

Hasler– (MOASPI) teaches the method of claim 12, wherein said applying the OECF comprises: $x_c = S^{-1}(W(\tau, x_o)S(x_o))$, wherein x.sub.o is an original pixel value in the second image, x.sub.c is a corrected pixel value in the second image, and W is a weight function defined as: $W(\tau, x_l) = \tau + (1 - \tau)x_l$. (Refer to Equation 4, left column, section 5, "The Complete Model").

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to apply the OECF as $x_c = S^{-1}(W(\tau, x_o)S(x_o))$, and define the weight function as $W(\tau, x_l) = \tau + (1 - \tau)x_l$. as taught by Hasler and to further define the OECF function as disclosed by Masaki because with the application of Equation 4(Hasler), applies the gains to adjust the white points and reapply the OECF." (Hasler, page 2, section 5, paragraph 2).

Regarding Claim 18:

Masaki discloses minimizing a color matching error between the corresponding pixel values, wherein the color matching error is generated from an optoelectronic conversion function (OECF) (Refer to Figure 4, numeral #41).

Masaki does not specifically disclose determining parameters of the OECF comprises minimizing a color matching error, the color matching error being defined as:

$$e=\sum_{i=0}^{255}\sum_{j=0}^{255} LUT[i][j]((i+1)/256.0-S^{-1}(\tau S((j+1)/256.0))),$$

wherein e is the color matching error, .tau. is a color matching parameter (Refer to Equation 2b, right column, section 4, "The Error Metric"); and S(x) is the OECF defined as:

$$S(x)=x+\frac{2}{\pi}\arctan\left(\frac{a\sin(\pi x)}{1-a\cos(\pi x)}\right),$$

wherein S(x) is the OECF, x is a pixel value normalized to (0,1), and a.epsilon.(-1,1) is another color matching parameter.

Hasler – (MOASPI) teaches the method of claim 17, wherein said determining parameters of the OECF comprises minimizing a color matching error, the color matching error being defined as:

$$e=\sum_{i=0}^{255}\sum_{j=0}^{255} LUT[i][j]((i+1)/256.0-S^{-1}(\tau S((j+1)/256.0))),$$

wherein e is the color matching error, .tau. is a color matching parameter (Refer to Equation 2b, right column, section 4, "The Error Metric"); and S(x) is the OECF defined as: $S(x) = x + \frac{2}{\pi} \arctan\left(\frac{a \sin(\pi x)}{1 - a \cos(\pi x)}\right)$, wherein S(x) is the OECF, x is a pixel value normalized to (0,1), and a.epsilon.(-1,1) is another color matching parameter (Refer to Equation 1, right column, section 3, "The OECF Model").

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to further define the OECF function as disclosed by Masaki, with reference to Equation 1, right column, section 3, "The OECF Model" as taught by Hasler because "the OECF with these definitive elements can "deliver an optimal result in a least square error sense." (Hasler, abstract).

Regarding Claim 20:

Masaki discloses color matching the second image to the first image by applying the OECF to the second image.

Masaki does not specifically disclose applying the optoelectronic conversion function comprising:

$x_c = S^{-1}(W(\tau, x_o) S(x_o))$, wherein x.sub.o is an original pixel value in the second image, x.sub.c is a corrected pixel value of the second image, and W is a weight function defined

as: $W(\tau, x_l) = \tau + (1-\tau)x_l$.

Hasler- (MOASPI) teaches the method of claim 19, wherein said applying the optoelectronic conversion function comprises:

$x_c = S^{-1}(W(\tau, x_o)S(x_o))$, wherein x.sub.o is an original pixel value in the second image, x.sub.c is a corrected pixel value of the second image, and W is a weight function defined

as: $W(\tau, x_l) = \tau + (1-\tau)x_l$. (Refer to Equation 4, left column, section 5, "The Complete Model").

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to further define the OECF function as disclosed by Masaki to determine additional application with reference to corrected pixel values as taught by Hasler at Equation 4 because " this application performs the balancing by using the weight factor and adjusts the white point and reapplies the OECF." (Hasler, Page 2, section 5, paragraph 2).

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Masaki (US 7,215,812 B1) in combination with Hasler, "Modeling the Opto-Electronic Conversion Function (OECF) For Application in the Stitching of Panoramic Images, as applied to claims 1-7 above, and further in view of Press,

"The Art of Scientific Computing, 10.1 Golden Search in One Dimension"-

hereinafter referred to as Press.

Regarding Claim 8:

Masaki and Hasler disclose determining at least one parameter of an optoelectronic conversion function (OECF) that best matches the corresponding pixel values and color matching the second image to the first image by applying the OECF with the at least one parameter to the second image wherein the OECF is defined as:

$$S(x) = x + \frac{2}{\pi}\arctan\left(\frac{a\sin(\pi x)}{1 - a\cos(\pi x)}\right),$$

, wherein x is a pixel value normalized to (0,1), and a epsilon.(-1,1) is another color matching parameter (Refer to Equation 1, right column, section 3, "The OECF Model").

The combination of Masaki and Hasler does not specifically disclose wherein said minimizing a color matching error comprises performing a golden section search of the color matching error (For example, refer to equations (10.1.6) and (10.1.7) in reference to the golden mean or golden section search examples).

Press teaches the method of claim 7, wherein said minimizing a color matching error comprises performing a golden section search of the color matching error (For example, refer to equations (10.1.6) and (10.1.7) in reference to the golden mean or golden section search examples).

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to perform a golden section search of the color matching error as illustrated through examples from Press and combine that search together with the "OECF" as disclosed by the combined teaching of Masaki and Hasler because "the golden section search guarantees that each new function evaluation will bracket minimum values to an interval at a precise number times the size of the preceding interval." (Press, page 399-400, last paragraph, final sentence).

Allowable Subject Matter

9. Claims 9, 14 and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

2003/0103677	5,664,027
2007/0172121	6,798,921
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- Szeliski et al. "Creating Full View Panoramic Image Mosaics and Environment Maps". 1997, pages 251-258.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mia M. Thomas whose telephone number is 571-270-1583. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Werner can be reached on 571-272-7401. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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